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CHALLENGES TO UKRAINE'S ENERGY SECURITY IN THE 21ST CENTURY

ABSTRACT

The article describes the main challenges to the energy security of Ukraine in the 21st c., including the context of hybrid warfare. As modern armed conflicts actively use the economic component (energy) alongside the military actions, it is expedient to focus on the energy sector characteristics of the Ukrainian economy. The article discusses the main sources of threats and challenges to Ukraine's energy security and the keystones of energy strategy for the next decade, followed by the analysis of several indicators of energy security and their dynamics in the years 2010–2014. A brief presentation of Russian military and economic impact on the energy security of Ukraine concludes the text.

Key words

hybrid war, energy security, competitiveness, monopoly power, fuel and energy complex

A peculiarity of a hybrid type war is that it is waged using predominantly non-linear tactics and is not aimed at capturing the entire territory of a country; however, it does not exclude capturing individual territories through patronage of an aggressor state achieved through influencing the target country's population as well as its business and power structures. Thus counteracting hybrid threats requires improving social resilience (Hibrydni zahrozy…, 2018).

Over the last three years the Russian-Ukrainian conflict has become long-term, multi-level cold warfare and has led to tectonic changes in the relations between Kyiv and Moscow. Due to the Russian aggression, Ukraine has borne unprecedented human, territorial and economic losses so that the only model of bilateral relations left to Ukraine seems to be confrontational coexistence with Russia – reactive, limited and forced. The Russian-Ukrainian hybrid war is not a local, peripheral conflict. The Kremlin's aggression poses a threat not only to the statehood of Ukraine and its sovereignty but also to the unity of the EU as a whole, to the political order of Europe.

The Russian-Ukrainian hybrid war is a threat to the Ukrainian society because of its unpredictability. First of all, it manifests itself in the weakness of the Ukrainian security system, namely its energy security. Permanent crises in the energy sector have accompanied the development of Ukraine's economy since it declared its independence. Their presence is connected to the internal problems of Ukraine as well as to the influence of geopolitical factors. At the same time, the changing geopolitical situation is not only a threat to Ukrainian energy security but also an impetus for radical reforms as it creates favorable conditions for development of the energy sector and encourages diversification in the energy market.

The economic crisis in Ukraine has been deepening as a result of many factors, i.e. hostilities in eastern Ukraine, loss of coal revenues from the occupied Donetsk and Luhansk regions, energy-intensive industrial production, and non-transparent tariff policy. These threats to Ukraine's national security are exacerbated by weakening support from the European Union and international financial organizations.

The above threats can be overcome or at least minimized by Ukrainian leaders only through a systematic reform of the energy sector, which, according to the *Energy Strategy of Ukraine until 2035* (2014), should include development of

market relations with Europe as well as creation of an institutional environment fostering competition between economic entities, diversification of energy supply sources, and deepening cooperation with EU countries.

In the *Energy Strategy of Ukraine for the Period Until 2030,* energy security is understood as an integral part of the state's security based on technologically reliable, stable, economically efficient and environmentally safe supply of energy resources. The authors believe that the main challenges to Ukraine's energy security faced with hybrid war include a shortage of investment in all sectors of the fuel and energy complex, excessive politicization of the energy sector, misguided state policy regarding the energy sector, lack of competition in the energy market and no relevant market infrastructure, lack of a clear and effective energy conservation program, and loss of control over the energy infrastructure of Crimea and the Luhansk and Donetsk regions.

After 1991, Ukraine inherited a huge economic complex that in 1991 consumed over 118 billion m^3 of gas, of which only 24.4 billion m^3 were Ukrainian production. After the Orange Revolution in 2005, the consumption still stood at 76 billion cubic meters, while production was reduced to 20.6 billion cubic meters (Komu nalezhyt…, 2014).

In 2015 alone, with the extraction level of 19.9 billion m^3 and the consumption level of 33.7 billion m^3, Ukraine managed to overcome its gas dependence on the Russian Federation by establishing reverse gas supply through Poland, Slovakia and Hungary. The payback for such a long process of gas dependence was Ukraine's geopolitical concessions: 1997 – write-off of doubtful gas debts for agreeing to the Black Sea Fleet's stay in Crimea until 2017; 2004 – the introduction of RosUkrEnergo scheme and the refusal of Euro-Atlantic course; 2010 – trading gas discount for another prolongation of the Black Sea Fleet's stay until 2042 (Hibrydni zahrozy…, 2018).

Energy security is a prerequisite for a stable national economy and for the ensuring reliable supply of fuel and energy resources to the state's population. The assessment of energy security level should be based on a number of indicators: energy supply, energy dependency, economic acceptability and social stability. The analysis of the indicators of Ukraine's energy security level shows that the national economy is characterized by low energy efficiency. This is a serious threat to the state's economic security, caused by the a number of factors hindering the development of the country's fuel and energy complex; some of them relate solely to the energy complex itself, while others represent the impact of multilevel macroenvironment (Enerhetychna stratehiia…, 2014; Hibrydni zahrozy…, 2018; Komu nalezhyt…, 2014).

The main factors that have led to the critical state of energy security include:

- investment deficit in all sectors of the fuel and energy complex;
- excessive politicization of the energy sector;
- flaws of the state's price, tax and tariff policies regarding the energy sector;
- lack of competitive energy market and no market infrastructure;
- Russian monopolistic practices regarding energy prices and supply terms;
- increasingly poor management of strategic energy resources reserves;
- hindered development of the fuel and energy complex, in particular gas and oil.

Elimination of imbalances and problems in the state's fuel and energy complex requires a sound and effective energy security policy that includes:

- a transparent and effective regulatory framework for the functioning of all energy sectors, which provides for regulation, coordination and control of the activities of the state's energy systems, nuclear energy and natural monopolies;
- authorities' guarantee and control of reliable energy supply in all sectors of economy;
- economic conditions ensuring the supply of energy resources to the domestic and foreign markets;
- effective management of strategic energy resources reserves that includes diversification of energy sources supply, prevention of energy resource misuse, harmonization of exhaustive resources consumption with the development of renewable energy sources, increased share of nuclear power and hydropower in the overall balance of fuel and energy resources;
- investment policy in the national energy sector, aimed at technological modernization of the fuel and energy complex as well as improvement of scientific, engineering and technical support and maintenance in the energy industry;
- technical regulations and safety and performance standards for energy facilities and installations, as well as a state oversight mechanism (Hibrydni zahrozy…, 2018; Komu nalezhyt…, 2014).

On July 24, 2013 the Cabinet of Ministers of Ukraine approved the updated version of the *Energy Strategy of Ukraine for the Period Until 2030. The Strategy* defines transformational mechanisms up to 2020 and sets strategic development guidelines up to 2035. It establishes Ukraine's main goal in energy development up to 2020, that is, ensuring energy security as well as energy-efficient use and consumption of energy resources, which includes implementation of innovative technologies (Enerhetychna stratehiia…, 2014).

The priorities for ensuring Ukraine's energy security of are as follows:

- reforming energy markets, ensuring transparency of economic activities, fostering competition in this field, integrating Ukraine's energy sector into EU energy markets and European system of energy security;
- improving energy efficiency and ensuring energy conservation;
- diversifying sources and routes of energy supply, minimizing dependence on Russia in terms of energy resources and technologies, developing renewable and nuclear energy, with environmental, nuclear and radiation safety as a priority;
- facilitating reliable energy supply as well as transit of energy resources within Ukraine, protecting energy infrastructure against terrorist threat;
- establishing a national system of energy supply to the economy and population for times of emergency;
- achieving high level of energy security, diversifying sources of energy carriers, increasing Ukraine's own production, increasing the efficiency of energy carriers use, introducing energy and resource-saving technologies (Enerhetychna stratehiia…, 2014).

Ukraine's legislative framework includes the following indicators of energy security:

1. state's share in the fuel and energy resources;
2. the level of state's dependence on the import of the primary energy resource;
3. the share of fuel imports from a single country (company) in the state's import volume;
4. the level of depreciation of the main production assets in the fuel and energy complex;
5. GDP energy intensity;
6. the ratio of investments in the fuel and energy complex to the GDP;
7. natural gas reserves;
8. coal reserves;
9. the share of renewable sources in total primary energy supply;
10. the share of losses in energy transportation and distribution (Enerhetychna stratehiia…, 2014).

The authors have analyzed five out of ten main indicators of economic security and their dynamics in 2010–2014. The calculations were based on the data from the reports of the State Statistics Service of Ukraine and the Ministry of Energy and Coal Industry of Ukraine (Enerhetychna stratehiia…, 2014; Enerhetychna bezpeka…, 2011; Enerhetychna haluz…, 2016).

One of the factors most important for ensuring energy security is the share of state's own sources in its balance of fuel and energy resources, calculated as the ratio of the difference between the total supply of primary energy and imports to the total supply of primary energy. During the period in question, the indicator was not optimal, but fluctuated between unsatisfactory and critical values. However, it is this indicator that characterizes the country's self-sufficiency and energy independence, and is therefore the basis of national security.

According to Annex 1, imports of basic energy resource (gas) in 2015 decreased by 15% compared to 2014 – unfortunately, caused not by a rise in gas production but a fall in electricity production. According to the Ministry of Energy and Coal Industry, Ukraine has the potential to increase its gas production by up to 50%, to the level of 29,000 million m^3 in 2020, which would guarantee independence in terms of this energy resource.

Another important indicator of energy security is the level of dependence on the import of the primary energy resource. Its value is calculated as the ratio of imports of the dominant resource in the primary energy supply to the total primary supply of the dominant resource. This indicator correlates closely with the previous indicator and also reached critical levels in 2011–2013, recovering after 2014.

The issue of reducing energy dependency can be partially addressed through creating an effective energy conservation program and the development of alternative energy in Ukraine. According to the abovementioned *Energy Strategy of Ukraine for the Period Until 2030*, the share of alternative energy in the country's total energy balance will be increased to 20%. The main directions of renewable energy in Ukraine are wind power, solar power, biofuels, and hydropower. The share of renewable resources in the total primary energy supply is calculated by the following formula: (hydropower supply in thousand tons of oil equivalent + supply of wind and solar energy in thousand tons of oil equivalent + supply of biofuels and waste in thousand tons of petroleum supply) /total supply of primary energy in thousand tons of oil equivalent. This indicator is also in the critical zone as rising trend was observed only in 2014 – unfortunately, due to a reduction of total electricity supply by 9%, while the supply of hydropower, wind energy, biofuels and waste decreased by 11.6% compared with 2013.

The indicator of losses in transportation and distribution of energy is important because it not only provides information on the efficiency and economy of the energy system but also directly affects the welfare of the population, since transportation losses are embedded in tariffs for end consumers. The share of losses in the transportation and distribution of energy is defined as the ratio of

the losses in the transportation and distribution of energy to the total primary energy supply. This indicator is permanently in the critical zone and still falling.

The ratio of investments in the fuel and energy complex to the gross domestic product is calculated as the ratio of capital investments with regard to economic activity type, as well as production and distribution of electricity, gas and water to GDP. In 2011–2014 this indicator was also unsatisfactory. Considering that the main source of investments in the enterprises of the fuel and energy complex are companies' own funds, with some tax support from the state this indicator can be adjusted to a positive value and cease to cause excessive concern.

One of the objectives of Russia's annexation of Crimea was to seize control over the energy infrastructure in the peninsula, especially the stationary extraction rigs and self-elevating drilling platforms as well as vessels of the technical fleet that extracted natural gas on the adjacent shallow shelf of the Black Sea. This seizure was made easy i.a. by the lack of Ukraine's mechanisms to protect its critical energy infrastructure. Thus, after reports of seizure came, no clear directions as to further actions were issued by the central office of NJSC Naftogaz of Ukraine, the Ministry of Energy of Ukraine, the Ministry of Defense, the Ministry of Internal Affairs, State Security Service or the National Security and Defense Council of Ukraine; thus no adequate measures were taken. Nor did the Maritime Border Service fulfill its duties identified in The Law of Ukraine "On Exclusive (Maritime) Economic Zone of Ukraine".

It is the authors' opinion that a comparative analysis of the materials of Russian analysts leads to the conclusion that one of the main goals of Russia is the complete destabilization of the energy sphere of Ukraine. Confirmation of this is the control in the energy sector (regional power companies) by Russian or pro-Russian owners, which makes possible silent diversions (sabotage or manufactured accidents resuting in production downtime), the introduction of malicious software for further cyber attacks, the destruction of strategic enterprises (Hibrydni zahrozy…, 2018).

According to the media, the VS Energy Group, owned by Russian businessmen, controls 10 Ukrainian power companies: "Kievoblenergo", "Chernivtsioblenergo", "Zakarpattyaoblenergo", "Odessaoblenergo", "Khersonoblenergo", "Rivneoblenergo", "Zhytomyrenergo", "Zhytomyr", "Kirovogradoblenergo" and "Mykolayivoblenergo", while the largest private Ukrainian energy holding company DTEK, controlled by a businessman Rinat Akhmetov, bought from VS Energy the shares of "Kyivoblenergo" and "Odesaoblenergo" for over $ 250 million (DTEK kupyv dva oblenerho…, 2019).

During Ukraine's large-scale privatization in 2011, the state removed 20 *oblenergos* from its strategic list and thus today there is no single power company in Ukraine not owned by a very small group of private investors. The shares of 27 companies are in the hands of five Ukrainian oligarchs: Rinat Akhmetov, Igor Kolomoysky, Yuriy Boyko, Igor Surkis and Konstantin Grigorishin. In the three years since the start of privatization, VS Energy Group became the leader in terms of assets. Its owners are Russian businessmen headed by Mikhail Spector: Yevgen Giner, Mikhail Voevodin and a former State Duma Deputy Speaker Alexander Babakov.

In the interests of national security, the Ukrainian government should wrestle control over such a large part of the Ukrainian grid from the Russian oligarchs. A similar view was presented by an Atlantic Council economic expert Anders Aslund in his post on the situation on the Ukrainian energy market: "Ukraine has also a national security problem in its grid. It is unfathomable that eleven of Ukraine's 24 regional electric distributors are to a large extent owned by a Russian group led by the Russian nationalist Aleksandr Babakov, who is sanctioned by all relevant coutries for his role in Russia's annexation and occupation of Crimea as vice speaker of the Russian State Duma" (Åslund, 2018).

Priority measures that can guarantee the energy security of the state are measures aimed at the following areas: upgrading production technology; increased control over energy consumption in all industries; introduction of energy-saving technologies; structural restructuring of the economy by reducing the share of energy-intensive industries; use of non-traditional and renewable energy sources. An important component of energy security may also be financing of exploration operations, which is a prerequisite for increasing Ukraine's level of oil and gas supply.

The above issues clearly suggest that in the 21st century Ukraine faces serious challenges of economic nature, where energy security is the underlying factor. Thus reduction of energy dependence, improvement of energy efficiency, environmental protection and social stability lie at the heart of the state's interests. Only the introduction of energy-saving technologies and improvements in the structure of domestic production will allow Ukraine to become independent of costly oil and gas imports as well as protect the state from Russian economic aggression.

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